

GCSE Maths: Quadratic equations with fractions (Higher): answers

GCSE Maths - Quadratic and Simultaneous Equations - Higher - Lesson 14.12

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch14-quadratics-simultaneous/higher/quadratic-equations-with-fractions/

Exercise 14L Quadratic equations with fractions Non-calculator

1 Solve.

(a) $x + \frac{12}{x} = 7$

Answer: $x = 3$ or $x = 4$

(b) $x - \frac{6}{x} = 1$

Answer: $x = -2$ or $x = 3$

(c) $x + \frac{8}{x} = 6$

Answer: $x = 2$ or $x = 4$

(d) $\frac{10}{x} = x + 3$

Answer: $x = -5$ or $x = 2$

(e) $x + \frac{20}{x} = 9$

Answer: $x = 4$ or $x = 5$

(f) $\frac{18}{x} = x - 3$

Answer: $x = -3$ or $x = 6$

2 Solve $\frac{1}{x} + \frac{2}{x+2} = 1$.

Answer: $x = -1$ or $x = 2$

3 Solve $\frac{3}{x} + \frac{4}{x+1} = 2$.

Answer: $x = -\frac{1}{2}$ or $x = 3$

4 Solve $\frac{4}{x} + \frac{5}{x+1} = 2$.

Answer: $x = -\frac{1}{2}$ or $x = 4$

5 Solve $x + \frac{3}{x} = 5$. Give your answers correct to 2 decimal places.

Answer: $x = 0.70$ or $x = 4.30$

6 Solve $\frac{5}{x} = x + 2$. Give your answers correct to 2 decimal places.

Answer: $x = -3.45$ or $x = 1.45$

- 7** Solve $\frac{1}{x-1} + \frac{1}{x+1} = 1$. Give your answers correct to 2 decimal places.

Answer: $x = -0.41$ or $x = 2.41$

- 8** A walker goes 24 km at x km/h and then returns the same 24 km at $(x + 2)$ km/h. The total time for both journeys is 7 hours. Find x .

Answer: $x = 6$ (the other solution, $x = -8/7$, is rejected because a speed cannot be negative)

- 9** A number added to its reciprocal makes $\frac{10}{3}$. Find the possible values of the number.

Answer: 3 or $\frac{1}{3}$

- 10** Show that $\frac{1}{x+2} + \frac{1}{x+3} = \frac{7}{12}$ can be written as $7x^2 + 11x - 18 = 0$. Then solve the equation.

Answer: $7x^2 + 11x - 18 = 0$; $x = -\frac{18}{7}$ or $x = 1$

- 11** Solve $x + \frac{1}{x} = 2$ and explain why it has only one solution.

Answer: $x = 1$ (the quadratic $x^2 - 2x + 1 = (x - 1)^2$ is a repeated root)